Abstract

The present invention is generally directed to compositions useful in preventing and/or treating disease due to infection by any of a variety of biologically active pathogenic microorganisms. The compositions include nanoparticles formed of a hydrophobic polymeric core, hydrophilic linking agents bound to the core, and biofunctional materials bound to the linking agents. The biofunctional materials are functionally identical to receptors on host cell surfaces that can be recognized and bound by adhesins on the surface of the targeted pathogenic adhesin-bearing microorganisms. In one embodiment, the binding action between the nanoparticles and the microorganisms can lead to the formation of large agglomerated complexes, which can then be easily removed from an area, including the digestive tract of an infected individual. The compositions of the present invention can also be utilized in preventing enteric infections via the ability to purge animals of enteropathogens prior to transport and processing for human consumption.